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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,662	01/28/2002	Ryoichi Mukai	2500.66134	3822
7590 12/21/2005			EXAMINER	
Patrick G. Burns, Esq. GREER, BURNS & CRAIN, LTD. Suite 2500 300 South Wacker Dr. Chicago, IL 60606			PIZIALI, ANDREW T	
			ART UNIT	PAPER NUMBER
			1771	

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/058,662

Applicant(s)

MUKAI, RYOICHI

Examiner

Andrew T. Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/26/05 & 1/28/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The RCE and amendment filed on 10/31/2005 have been entered. The examiner has withdrawn the objection to the drawings based on the amendments to the specification. The examiner has withdrawn the rejections of claim 18 based on the cancellation of claim 18.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 19 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

Claim 19 states that each of the crystal grains contact each other at grain boundaries, but the specification does not mention crystal grains contacting each other at grain boundaries. The Figures also fail to show this claimed limitation. Although Figures 2, 10 and 11 illustrate grain areas (29) as perfectly shaped rectangles due to perfectly straight grain boundaries (31), the figures and/or specification do not teach or suggest that the grains grow in perfect rectangular form around the nucleation site (27). The Figures merely illustrate the approximate area within which the grains partially occupy.

According to the teaching of USPN 5,846,648 to Chen et al., when a grain grows on a spatially spaced nucleation site, the grain does not contain the nucleation site, rather, the grain

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grows vertically on top of the nucleation site and the size and spacing of the nucleation site dictates the size and spacing of the corresponding grain (see column 8, lines 15 through column 9, line 53, and Figure 2). Thus, the current figures and the current specification convey to one skilled in the relevant art that each crystal grain grows vertically over a nucleation site rather than growing outwardly in every direction (into a perfect rectangular shape) and contacting each other at (perfectly straight) grain boundaries.

#### ***Claim Objections***

4. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Claim 1 already established that the metallic islands include a metallic compound.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,162,158 to Christner et al. (hereinafter referred to as Christner).

Regarding claims 1 and 2, Christner discloses a polycrystalline structure film comprising metallic alloy (compound) islands (43) formed on a surface of a substrate (16) and physically spaced from each other so as to expose a metallic compound (alloy) among the

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metallic islands, and a metallic crystal layer containing crystal grains (36, 38, 40 and 42), each of the crystal grains having grown from a corresponding one of the metallic islands so as to stand from a surface of the metallic compound (see entire document including Figure 3, column 3, line 24 through column 4, line 10, and column 5, lines 52-64).

Regarding claim 2, Christner discloses that the metallic islands (43) may consist of a combination of metallic elements (column 5, lines 52-64).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,631,094 to Ranjan et al. (hereinafter referred to as Ranjan) in view of USPN 5,162,158 to Christner.

Regarding claims 1-4, Ranjan discloses a polycrystalline structure film comprising metallic islands formed on a surface of a substrate wherein said metallic islands include a compound ( $\text{Al}_2\text{O}_3$ ), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains having grown from the metallic islands (see entire document including column 6, lines 10-42).

Ranjan discloses that the noise of interparticle exchange interaction can be reduced by spacing the grains of the magnetic layer (column 2, lines 12-14, 41-44 and 59-65), but Ranjan does not specifically disclose how to separate the grains of the nucleation layer. Ranjan is silent

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with regards to specific method for spacing the grains, therefore, it would have been obvious to look to the prior art for conventional methods. Christner provides this conventional teaching showing that it is known in the art to space the nucleation sites to result in spaced grains (see entire document including Figure 3 and column 3, lines 24-61). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to space the grains of Ranjan by spacing the underlying nucleation sites, as taught by Christner, motivated by the expectation of successfully practicing the invention of Ranjan.

Regarding claims 2-4, Ranjan discloses that the compound may be  $\text{Al}_2\text{O}_3$  (column 6, lines 10-28).

9. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen et al. (hereinafter referred to as Chen) in view of USPN 5,162,158 to Christner.

Regarding claims 1 and 2, Chen discloses a polycrystalline structure film comprising metallic islands (76) formed on a surface of a substrate wherein said metallic islands including a compound (an alloy is considered a compound), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains (78) having grown from the metallic islands (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-26, column 11, lines 11-22 and column 16, lines 9-46).

Chen does not appear to teach that the islands are physically separated, but Chen does disclose that the noise of interparticle exchange interaction can be reduced by spacing the grains of the magnetic layer (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Christner discloses that it is known in the

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art to space the nucleation sites to result in spaced grains (see entire document including Figure 3 and column 3, lines 24-61). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to space the grains of Chen by spacing the underlying nucleation sites, as taught by Christner, because the noise of interparticle exchange interaction could be reduced.

Regarding claim 2, Chen discloses that the metallic islands (76) may consist of a combination of metallic elements (an alloy) (column 11, lines 11-22).

10. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 5,162,158 to Christner in view of USPN 6,150,015 to Bertero et al. (hereinafter referred to as Bertero).

Regarding claims 1-6, Chen discloses a polycrystalline structure film comprising metallic islands (76) formed on a surface of a substrate wherein said metallic islands including a compound (an alloy is considered a compound), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains (78) having grown from the metallic islands (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-26, column 11, lines 11-22 and column 16, lines 9-46).

Chen does not appear to teach that the islands are physically separated, but Chen does disclose that the noise of interparticle exchange interaction can be reduced by spacing the grains of the magnetic layer (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Christner discloses that it is known in the art to space the nucleation sites to result in spaced grains (see entire document including Figure 3 and column 3, lines 24-61). Therefore, it would have been obvious to one having ordinary skill

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in the art at the time the invention was made to space the grains of Chen by spacing the underlying nucleation sites, as taught by Christner, because the noise of interparticle exchange interaction can be reduced.

In the event that it is determined that an alloy is not considered a compound, it is noted that Chen discloses that the nucleation sites may be formed of any material that allows for the epitaxial growth of the Co-based recording layer (column 11, lines 10-22). Bertero discloses that the most ideal material choice for a nucleation layer is the same composition used for the magnetic layer (column 13, lines 40-42). Considering that Chen discloses that the magnetic layer may comprise a magnetic material together with a compound such as an oxide or nitride of silicon or aluminum (column 11, lines 56-62), it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the nucleation layer with the same composition used for the magnetic layer, because Bertero discloses that this is material is ideal for epitaxial growth of the magnetic layer and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability.

Regarding claims 2-6, Chen discloses that the compound may be  $\text{Si}_3\text{N}_4$ ,  $\text{SiO}_2$  or  $\text{Al}_2\text{O}_3$  (column 11, lines 57-62).

Regarding claim 5, Chen discloses that platinum may be present in the magnetic layer (column 15, lines 5-10). Considering that it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the nucleation layer with the same composition used for the magnetic layer (as explained above), the nucleation layer would also contain platinum.

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Regarding claim 6, Chen discloses that the compound may be added at about or below 10 molar percent (column 12, lines 12-28).

***Response to Arguments***

11. Applicant's arguments filed 10/31/2005 have been fully considered but they are not persuasive.

The applicant asserts that Christner does not read on the current claims because the crystal grains (36, 38, 40 and 42) are deposited only on the top surfaces of the islands (43) of the chromium alloy (compound) layer (20) and not on the surface of the substrate (16). The examiner respectfully disagrees. The claims do not require the crystal grains to be deposited on the top surface of the substrate (16), rather, the claims require that the crystal grains be deposited on the top surfaces of the islands.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

g7J. 11/15/05

atp

**ANDREW T. PIZALI**  
**PATENT EXAMINER**